

**CLAIMS**

1. A catalyst producing method comprising:

preparing reverse micellar solution including an aqueous  
5 solution containing at least a noble metal element as a catalytic  
active component, and carrying the catalytic active component  
by a substrate to establish them into a catalyst precursor; and

spraying the emulsion solution containing the catalyst  
precursor in an inert gas atmosphere to obtain a dried catalyst  
10 precursor, and firing the obtained dried catalyst precursor in  
an air atmosphere.

2. The catalyst producing method as claimed in claim 1, wherein  
a molar ratio (RW) of water encapsulated in the reverse micelle  
15 relative to a surfactant forming the reverse micelle is 20 or  
less.

3. The catalyst producing method as claimed in claim 1 or 2,  
wherein the catalytic active component further includes at least  
20 one of a transition metal element and a rare earth element.

4. The catalyst producing method as claimed in claim 1, wherein  
the carrying comprises:

preparing a solution including a solvent containing a  
25 dispersed powder of oxide forming the substrate; and

mixing the prepared solution and the emulsion solution  
to carry the catalytic active component by the substrate to  
thereby establish them into the catalyst precursor.

5. The catalyst producing method as claimed in claim 1, wherein the carrying comprises:

preparing a hydroxide to be matured into an oxide forming the substrate; and

5 clathrating the catalytic active component contained in the reverse micelle contained in the emulsion solution by the prepared hydroxide to carry the catalytic active component by the substrate to thereby establish them into the catalyst precursor.

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6. The catalyst producing method as claimed in claim 1, wherein the noble metal element comprises at least one noble metal element selected from Ru, Rh, Pd, Ag, Ir, Pt, and Au.

15 7. The catalyst producing method as claimed in claim 2, wherein the transition metal element comprises at least one transition metal element selected from Mn, Fe, Co, Ni, Cu, and Zn.

8. The catalyst producing method as claimed in claim 2, wherein  
20 the rare earth element comprises at least one of La and Ce.

9. A catalyst obtained by the catalyst producing method according to any one of claims 1 through 8.

25 10. A catalyst obtained by:

preparing reverse micellar solution including an aqueous solution containing at least a noble metal element as a catalytic active component, and carrying the catalytic active component by a substrate to establish them into a catalyst precursor; and

spraying the emulsion solution containing the catalyst precursor in an inert gas atmosphere to obtain a dried catalyst precursor, and firing the obtained dried catalyst precursor in an air atmosphere.